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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,859	09/17/2003	Vijayakrishna Prasad Guduru	1020.P16468	8505

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/665,859	GUDURU, VIJAYAKRISHNA PRASAD	
	Examiner	Art Unit	
	Daniel D. Abebe	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-15 and 17-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8-11* is/are allowed.

6)☒ Claim(s) *1,3-5,7,12-15,17-19,21-23* is/are rejected.

7)☒ Claim(s) *6 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

Allowable Subject Matter

Claims 8-11 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: the claims are allowed because the prior arts do not teach including the echo canceller as recited in the claims.

Claims 6 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

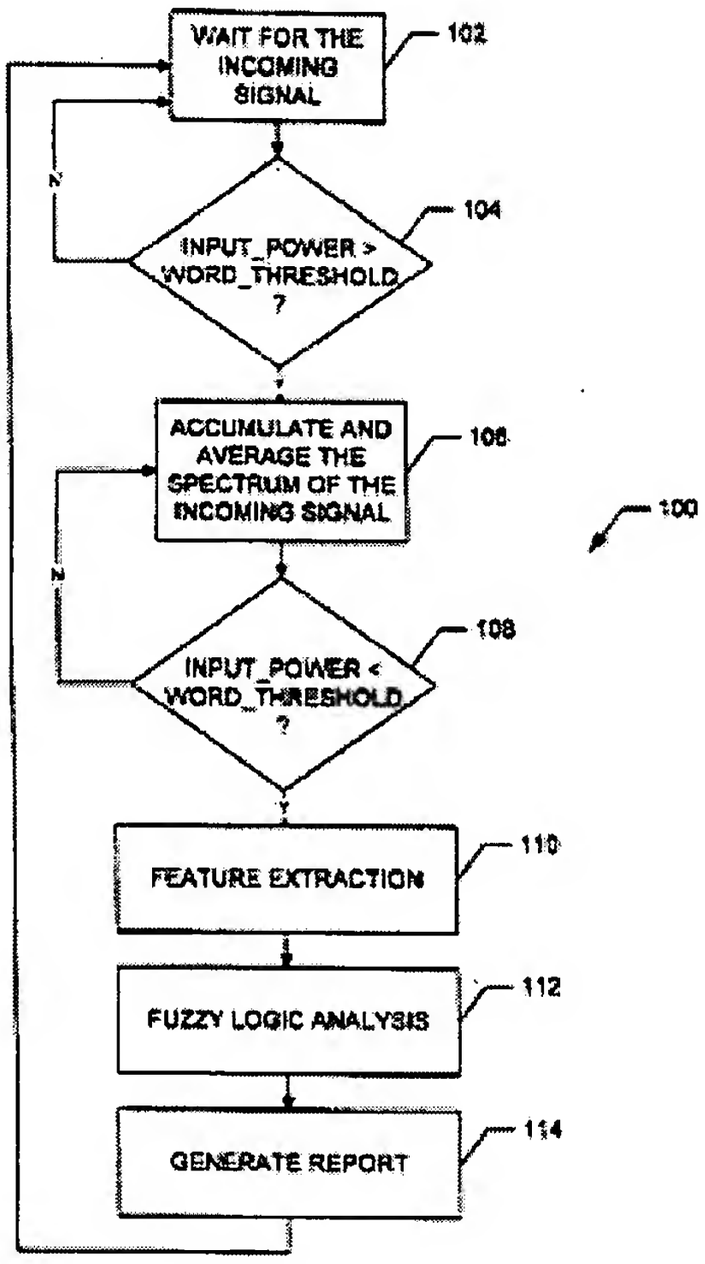
> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-5, 7, 12-15, 17-19 and 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Berestesky (6,321,194).

As to claims 1, 3-5 and 7, Berestesky teaches a method for voice detection in audio signals, comprising the steps of:

Receiving an input audio frame;

Determining whether the audio frame comprises human voice using fuzzy logic algorithm from values of parameter (array of elements) extracted from the audio signals (abstract; Col.2, lines 10-15; Fig.4).



IG. 6

According to Berestesky the method of using fuzzy logic technique to analyze the characteristics and determine whether the input is voice disclosed in detail

"When the switch 60 closes, output of spectrum 5 accumulator 58 is provided to feature extraction blocks 62, 64, 66 which calculate values based on elements in the array Y.sub.s. A first block 62 calculates feature L1; a ratio of a sum of lower-frequency spectrum components to a sum of higher-frequency spectrum components in Eqn. 2: ##EQU3##

7

If the audio signal has a frequency spectrum that spans the range [250, 2500] Hz of frequencies, then L1 would be on the order of 1.

8

A second block 64 calculates feature L2, a ratio of a maximum value (MAX) of the lower-frequency elements in the 15 array to a sum of all other lower-frequency elements in the array: ##EQU4##

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L2 is a measure of a lower-frequency spectrum shape in the audio signal. For example, if the audio signal were a tone with a single frequency component of 480 Hz, then L2 would be relatively large since the maximum value (MAX) would be the value of Y.sub.s at a frequency of 480 Hz and all other frequency components would be much smaller than the maximum value. If, on the other hand, the audio signal corresponded to noise, then L2 would be relatively small since the maximum value (MAX) is about the same size as all other frequency components in that range.

10

A third block 66 calculates feature L3, a duration T of the word:

L3=T (5)

11

L3 is a measure of the length of the word.

12

L1, L2, and L3 are used as input values for corresponding fuzzy set blocks A 68, B 70, and C 72. Each fuzzy set block output f.sub.i (L), where i .di-elect cons. [A,B,C] and L .di-elect cons. [L1,L2,L3], represents a degree of membership in the fuzzy set for a particular value of the input feature L. The degree of membership f.sub.i (L) is a value (ranging from 0 to 1) of a membership function f.sub.i at point L. Degree of membership f.sub.i (L) shows how much the value of the feature (L) is compatible with the proposition that the input signal 16 represents human speech. FIG. 5 shows an example of a generalized membership function f 80 as a function of the feature L given in arbitrary units. For a value of L equal to l.sub.1 (at point 82), the fuzzy set outputs a value of 0.0 which indicates that the input signal 16 does not represent human speech. Similarly, for L equal to l.sub.2 (at point 84), the fuzzy set outputs a value of 0.16 which indicates that the input signal 16 almost assuredly does not represent human speech. In contrast, for L equal to l.sub.3 (at point 86), the fuzzy set outputs a value of 1.0 which indicates that the input signal 16 represents human speech." (Col.4-Col.5, line 40)

Claims 12-15, 17-19 and 21-23 are analogous to the claims that are addressed above and are rejected by Berestesky for the foregoing reasons.

In Addition to the rejection above by Berestesky, Claims 12, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamilton (5,450,484).

As to claims 12, 22 and 23, Hamilton teaches a voice detector comprising:

Energy estimating means; and

Voice classifier to classify voice for a frame of an input signal according to the energy level as well as other signal characteristics values including the frequency spectrum (abstract; Col.6, line 15-Col.7, line 20).

According to Hamilton

"the present invention shown in FIG. 2 for use in analyzing analog signal 100 which is transmitted over the public switched telephone network (PSTN) and which has a 4000 Hz bandwidth, analog signal 100 is sampled, in accordance with the Nyquist criterion, at least 8000 times/sec and the predetermined number of samples or values per frame is chosen to be 128. Further, in the preferred embodiment, in order to increase temporal resolution, a frame of 128 values which is input to DSP 65 for Fourier analysis is comprised as follows. The "present" frame comprises the last 32 samples or values from the previous frame and the next or "new" 96 samples or values which have been obtained from input signal 100. As a result, the "next" frame to be Fourier analyzed by the FFT after the "present" frame comprises the 32 "old" samples or values from the "present" frame and the next 96 samples or values obtained from input signal 100. Then, prior to calculating the FFT, each sample or value S.sub.n (where n=0, . . . , 127) is multiplied by a windowing function, the values of which windowing function have been previously stored in memory. Various windowing functions which are suitable for such use are well known to those of ordinary skill in the art and are advantageous in that their use reduces anomalous spectral components due to the finite frame length of 128 samples.

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As a result of the above, when DSP 65 of FIG. 2 is embodied in a Motorola 56000DSP and 128 samples are used to perform a Fast Fourier Transform (FFT), a 128 bin frequency spectrum for the input signal is produced wherein the frequency bins are 62.5 Hz wide. Each frequency bin in the frequency spectrum has a bin index denoted by n. However, because the signal is real, only the first 64 bins are of interest since the last 64 bins are identical to the first 64 bins. The real and imaginary coefficients determined by the FFT for each frequency bin are squared and summed to provide a bin energy e(n) **for each frequency bin in the frequency spectrum and, in addition, the energies for each bin are summed to provide the total energy etot for the frame.** Next, a predetermined number of energy maxima in the frequency spectrum of the frame are determined. An energy maximum is defined as the occurrence of a bin in the frequency spectrum of a frame which has more energy than its adjacent sidebins and, in accordance with a preferred embodiment of the present invention, the only energy maxima determined are the three largest in the spectrum. DSP 65 determines whether a third spectral peak exists in the frame; if so, DSP 65 sets flag ptotflg=1 and determines the signal-to-noise ratio (SNR=(E.sub.1 +E.sub.2)/E.sub.3 where E.sub.n is the energy of the nth peak). Then, DSP 65 transmits the total energy of the frame, the frequency and energy of the two largest energy peaks, SNR, and flag ptotflg to microprocessor 50 for analysis.

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Microprocessor 50 analyzes the output from DSP 65 to detect whether a telephone signal has been produced by a voice. In particular, embodiments of the present invention detect the initial presence of a voice at the beginning of a telephone call and quickly and accurately detect a voice --normally within 100 ms of inception--while avoiding false detection during ringback or other telephone network tones and signals. As will be described below, the detection decision is based on energy, frequency and signal-to-noise characteristics of the input signal. Then, microprocessor 50 characterizes the window as either having been produced by a voice or not and all appropriate counters, variables, and flags are reset and the loop of collecting frames for the next window is restarted from the beginning. Microprocessor 50 then transmits the window characterization information to host computer 30. "

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel D. Abebe whose telephone number is 571-272-7615. The examiner can normally be reached on monday-friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Daniel Abebe Primary Examiner A.U. 2626

August 1, 2007